77TH CONGRESS } HOUSE OF REPRESENTATIVES { DOCUMENT
1st Session } { No. 284

FERNANDINA HARBOR AND AMELIA RIVER, FLA.

LETTER

FROM

THE SECRETARY OF WAR

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, UNITED STATES ARMY, DATED MARCH 20, 1941, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND AN ILLUSTRATION, ON REEXAMINATION OF FERNANDINA HARBOR AND AMELIA RIVER, FLA., REQUESTED BY RESOLUTION OF THE COMMITTEE ON RIVERS AND HARBORS, HOUSE OF REPRESENTATIVES, ADOPTED MAY 29, 1940

JUNE 19, 1941.—Referred to the Committee on Rivers and Harbors, and ordered to be printed with an illustration

WAR DEPARTMENT,
Washington, June 14, 1941.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated March 20, 1941, from the Chief of Engineers, United States Army, on reexamination of Fernandina Harbor and Amelia River, Fla., requested by resolution of the Committee on Rivers and Harbors, House of Representatives, adopted May 29, 1940, together with accompanying papers and illustration.

The Bureau of the Budget has been consulted and advises that there would be no objection to the submission of the report to Congress.

Sincerely yours,

HENRY L. STIMSON,
Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 20, 1941.

The CHAIRMAN, COMMITTEE ON RIVERS AND HARBORS,
House of Representatives, Washington, D. C.

MY DEAR MR. CHAIRMAN: 1. The Committee on Rivers and Harbors of the House of Representatives, by resolution adopted May 29, 1940, requested the Board of Engineers for Rivers and Harbors to review the reports on Fernandina Harbor and Amelia River, Fla., submitted in House Document No. 548, Seventy-fifth Congress, third session, and previous reports, with a view to determining if it is advisable to modify the existing project in any way. I enclose the report of the Board in response thereto.

2. After full consideration of the reports secured from the district and division engineers, the Board recommends that the existing project for Fernandina Harbor and Amelia River, Fla., be modified to reduce the maximum width of the turning basin from 1,000 to 800 feet, shifting the southerly channel line in this vicinity 50 feet northwesterly, and to include in the authorized project at no additional cost the small area dredged by Rayonier, Inc.

3. After due consideration of these reports, I concur in the views and recommendations of the Board.

Very truly yours,

J. L. SCHLEY,
Major General,
Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

WAR DEPARTMENT,
THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., January 27, 1941.

Subject: Fernandina Harbor, Fla.
To: The Chief of Engineers, United States Army.

1. This report is in response to the following resolution, adopted May 29, 1940:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the River and Harbor Act, approved June 13, 1902, be and is hereby, requested to review the reports on Fernandina Harbor, and Amelia River, Florida, submitted in House Document Numbered 548, Seventy-fifth Congress, third session, and previous reports, with a view to determining if it is advisable to modify the existing project in any way.

2. Fernandina Harbor is on the east coast of Florida 20 miles north of Jacksonville. It is entered from the Atlantic Ocean through Cumberland Sound and extends southward from the entrance to the terminals on Amelia River. The existing project for improvement provides for two stone jetties at the entrance, the north jetty 19,150 feet long and the south jetty 11,200 feet long; for a channel 28 feet deep at mean low water from deep water in the ocean to deep water at the junction of Lanceford Creek and Amelia River, with widths of 400 feet below Calhoun Street in the city of Fernandina, and 300 feet

above; and for widening of the channel at the first bend below Lanceford Creek to 1,000 feet to form a turning basin. The mean range of tide is 5.8 feet on the bar at the entrance and 6.0 feet in the inner harbor. The project is completed except that the turning basin has a depth of 28 feet for a maximum width of only 800 feet. Expenditures to June 30, 1940, were $3,286,818 for new work and $748,433 for maintenance. The approved estimate of annual cost of maintenance is $31,000.

3. Fernandina has a population of 3,000 and is the headquarters for a large commercial fishing fleet operating in the tidal waters along the coast. Its industries include a fish canning factory, a fertilizer plant, a phosphate rock plant, two pulp mills and boat yards for building small craft. The harbor is served by a branch line of the Seaboard Air Line Railway and is connected with the mainland by a paved highway. On the two miles of water front there are 5,050 lineal feet of wharf space. The waterborne commerce averages about 180,000 tons per year. In 1939 it amounted to 177,600 tons and included 97,000 tons of phosphate rock exported, 24,500 tons of wood pulp, 24,500 tons of fish and 18,000 tons of petroleum products. It was carried in 91 in- and out-bound trips of vessels drawing from 12 to 26 feet and 11,123 in- and out-bound trips of vessels drawing less than 12 feet.

4. Local interests request that the project for improvement of the harbor be modified so as to provide a depth of 30 feet. They claim that the increased depth will result in better steamship service and permit loading of wood pulp in deep-draft vessels on top of other cargo, reducing the time in transit and damage to the bundles.

5. The district engineer estimates the cost of providing a depth of 30 feet at $108,000 for new work, and $2,000 annually for maintenance in addition to that now required. The request for greater depth was made at a time when a new development for manufacturing products for national defense was expected to locate at Fernandina, but the plant was not erected, and now justification for improvement rests on the needs of present traffic. In his opinion, the present depth is adequate and benefits from further deepening would be less than the cost. He recommends that no modification be made of the existing project except to reduce the maximum width of the turning basin to 800 feet, shift the southerly channel line in the vicinity 50 feet northwesterly and include an area opposite the terminal of Rayonier, Inc., at no additional cost. The division engineer concurs in the views and recommendations of the district engineer.

6. Local interests were advised of the partially adverse conclusions of the reporting officers and were invited to submit additional information to the Board. No communications were received.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

7. The Board is of the opinion that the present project depth of 28 feet at low tide, with a tidal rise of over 5 feet, provides adequate depth for the commerce of the harbor and that the vessel traffic which may require a depth of over 28 feet is too small to justify the expenditure necessary for further deepening of the channels. Minor changes in the anchorage and channel alinement are necessary to facilitate

maintenance work and eliminate possible damage from operation of dredges too close to terminal structures. The Board therefore recommends that the existing project for Fernandina Harbor and Amelia River, Fla., be modified to reduce the maximum width of the turning basin from 1,000 to 800 feet, shifting the southerly channel line in this vicinity 50 feet northwesterly, and to include in the authorized project at no additional cost the small area dredged by Rayonier, Inc.

For the Board:

THOMAS M. ROBINS,
Brigadier General, Corps of Engineers,
Senior Member.

REEXAMINATION OF FERNANDINA HARBOR AND AMELIA RIVER, FLA.

SYLLABUS

The district engineer recommends that no modification be made in the present project for Fernandina Harbor, Fla., at the present time, except to reduce the maximum width of the turning area in the southerly end of the harbor from 1,000 feet to 800 feet, move the channel therein northwesterly 50 feet, and to include the area covered by compensatory dredging by Rayonier, Inc., opposite their terminal in the authorized project, all at no additional costs for improvement or maintenance.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
Savannah, Ga., September 20, 1940.

Subject: Review of report on Fernandina Harbor and Amelia River, Fla.

To: The Chief of Engineers, United States Army. [Through the Division Engineer, South Atlantic Division.]

1. *Authority.*—The report is submitted in accordance with the following resolution by the Committee on Rivers and Harbors of the House of Representatives, United States, adopted May 29, 1940:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on Fernandina Harbor, and Amelia River, Florida, submitted in House Document Numbered 548, Seventy-fifth Congress, third session, and previous reports, with a view to determining if it is advisable to modify the existing project in any way.

The reports under review are listed and described in paragraphs 5 and 6.

2. *Description.*—(*a*) Fernandina Harbor is located on the Atlantic coast in the northeast corner of Florida. The only entrance to Fernandina Harbor from the Atlantic Ocean for ocean-going shipping is through the jetty channel, in the mouth of Cumberland Sound, 23 miles north of the entrance to Jacksonville Harbor, and 25 and 95 miles south of the entrances to Brunswick and Savannah, Ga., harbors, respectively. The Intracoastal Waterway from Beaufort, S. C., to St. Johns River, Fla., passes through the harbor, providing a route to the north and south for shallow-draft vessels. This waterway is under improvement with a view to increasing its depth from 7 to 12 feet. A general map, in one sheet, is enclosed, on which is shown an

index map giving the general location of Fernandina Harbor, and an insert showing details of the improvement proposed.

(*b*) Fernandina Harbor consists of a channel across Cumberland Bar, improved by twin stone jetties, the southerly part of Cumberland Sound, and approximately 3½ miles of Amelia River to its junction with Lanceford Creek, a total distance of a little more than 7 miles. The harbor is three-fourths mile wide between the jetties, 1 mile wide in Cumberland Sound, and one-fourth mile wide in Amelia River in front of the city of Fernandina. The mean range of tide is 5.8 feet on the bar and 6 feet in the inner harbor. On May 14, 1940, the date of the survey made immediately after improvement dredging, the channel over the bar outside of the jetties had depths ranging from 33 to 48 feet. Between the jetties, depths varied from 28.5 feet on a shoal about 1 mile from the outer end to 68 feet opposite the inner end of the jetty channel. From Cumberland Sound to opposite the town of Old Fernandina, the Amelia River had natural depths of 28 to 51 feet over a minimum width of 400 feet. From Old Fernandina to the confluence of Amelia River and Lanceford Creek, the harbor had been improved by dredging to a depth of 28 feet over widths of 400 feet to Calhoun Street and 300 feet from Calhoun Street to Lanceford Creek. In the first bend of the channel north of Lanceford Creek the channel had been widened to provide a turning basin having a depth of 28 feet and a maximum width of 800 feet. As a result of the improvement dredging, there were only a few shoal spots in the channels and turning basin where the depths were less than 30 feet at mean low water.

3. *Tributary area.*—Fernandina, Fla., is a town of about 3,000 population (1930 census) located on Amelia Island. It is headquarters for a large commercial fishing fleet which furnishes raw material to a canning factory and a fertilizer factory. The fleet operates in tidal waters along the Georgia and Florida coast. There are also some boat yards in the harbor where power fishing boats and other small craft are built. At the Florida Terminal Co.'s plant, phosphate rock is dried and loaded in ocean-going vessels. This rock is shipped by rail to the plant from mines in northern Florida. Two pulp mills are located on Amelia Island, one in the southern part of the harbor and the other about midway between the town of Fernandina and the north end of the island. Pulpwood comes to these mills by land and water from northern Florida and southern Georgia and wood pulp is shipped out by rail and by water. Fernandina is served by a branch line of the Seaboard Air Line Railway and the town is connected with the mainland by a paved highway.

4. *Bridges.*—No bridges cross the harbor and none are contemplated. The nearest ones are the highway and railway bridges over the Intracoastal Waterway about 4 miles south of the harbor. Both are drawbridges having horizontal clearances of 80 feet and 50 feet, respectively.

5. *Prior reports.*—The following are reports on projects for the improvement of Fernandina Harbor prior to the existing project:

Senate Document No. 60, Forty-fourth Congress, first session, recommends dredging the bar instead of jetty construction.

Report dated June 30, 1879—no recommendation.

Senate Executive Document No. 152, Forty-sixth Congress, second session, submits estimate of cost of shore protection but recommends no action if jetties are built.

Senate Document No. 47, Forty-seventh Congress, second session, recommends protection to partially completed jetties and completion of jetties.

Report of Board of Engineers (Annual Report, 1891), recommends jetty extensions.

Senate Document No. 19, Fifty-second Congress, second session, recommends extension and raising of north jetty.

Senate Document No. 163, Fifty-fifth Congress, first session, recommends sluicing, dredging, and raising jetties.

House Document No. 388, Fifty-ninth Congress, first session, recommends dredging inner harbor 20 to 24 feet deep.

House Document No. 227, Sixty-eighth Congress, first session, recommends extending channel in inner harbor and deepening to 26 feet.

6. *Existing project.*—(*a*) Construction of the twin jetties at the entrance to the harbor was begun under the project "Cumberland Sound, Fla. and Ga.," authorized by the act of June 14, 1880. This project provided for low jetties to give a depth of 19 feet across the bar. The act of June 3, 1896, provided for raising the jetties to the height of mean high water, and this work was completed in 1905. Improvement of the inner harbor was begun in 1907, under authority of the act of March 2, 1907 (H. Doc. No. 388, 59th Cong., 1st sess.), to provide a channel 19 feet deep across the bar, a channel 24 feet deep and 600 feet wide over a shoal opposite Old Fernandina, a channel 22 feet deep from the foot of Calhoun Street to the upper end of Hill wharf, the lower half (1,800 feet) to be 500 feet wide and the upper half to be 400 feet wide; and thence a cut 20 feet deep and 400 feet wide through a shoal just above the Hill wharf, thus providing deep water into Lanceford Creek. The act of March 3, 1925 (H. Doc. No. 227, 68th Cong., 1st sess.), provided for further improvement of the harbor by the construction of a channel 26 feet deep at mean low tide and 400 feet wide from the sea to Calhoun Street, and thence 300 feet wide to the south end of the Florida Terminal Co.'s development.

(*b*) The existing project was adopted by the River and Harbor Act of June 20, 1938 (H. Doc. No. 548, 75th Cong., 3d sess.). It provides for modification of the project to provide a channel 28 feet deep from deep water in the Atlantic Ocean to deep water at the junction of Lanceford Creek and Amelia River, with widths of 400 feet north of Calhoun Street in the city of Fernandina and 300 feet south of Calhoun Street, and for widening the channel at the first bend north of Lanceford Creek to 1,000 feet to form a turning basin, at an estimated cost of $138,000, with maintenance estimated at $31,000 annually for the entire project as modified, provided local interests furnish free of cost to the United States any lands needed for the improvement and suitable spoil disposal areas for new work and for subsequent maintenance, as required. The project so modified was completed in May 1940. On June 30, 1940, the costs and expenditures had been $3,286,818.06 for new work and $748,432.61 for maintenance.

7. *Local cooperation.*—(*a*) In the improvement of Fernandina Harbor, prior to adoption of the present project, no local cooperation has been required and none has been furnished except that the lands on the southerly end of Cumberland Island and on the northerly end of Amelia Island necessary for the shore ends of the stone jetties were furnished without cost to the United States. Marsh lands opposite Fernandina have at times been used as spoil disposal areas during

improvement and subsequent maintenance operations without cost to the United States.

(*b*) To comply with the local cooperation requirements under the present project, local interests deeded to the United States, without cost, 6 tracts of land, totaling about 440 acres for spoil-disposal areas. The locations of these tracts are shown on the general map herewith. No additional spoil-disposal areas will be needed for the improvement desired.

(*c*) It was stated at the hearing that no other local cooperation may be expected in connection with the desired improvement.

8. *Other improvements.*—(*a*) In order to provide waterway cross-sectional areas to compensate for the extension channelward of its wharf under a War Department permit, Rayonier, Inc., dredged to a minimum depth of 28 feet at mean low water an area opposite its terminal. This area and the proposed wharf extension are shown on the general map herewith. The dredging amounted to 7,630 cubic yards, the cost being about $800.

(*b*) Prior to erection of its mill, Rayonier, Inc., did some dredging in the harbor immediately channelward of its terminal to obtain fill material for the plant site. The dredging resulted in an increase in navigable depths southward of the then authorized channel.

(*c*) Insofar as is known, there have been no other navigation improvements made by local interests in any of the immediately tributary waterways.

9. *Terminal and transfer facilities.*—In the inner harbor there are 5,051 linear feet of wharf space located along the 2 miles of water front. Of the 21 piers and wharves at Fernandina, 2 are owned by the Seaboard Air Line Railway Co., 1 by the city, 1 by the Fernandina Terminal Corporation, 1 by the Container Corporation of America, and 1 by Rayonier, Inc. The others are privately owned and are used largely by the commercial fishing industry, fuel-oil retailers, boat-builders, and fish-fertilizer plants. The city of Fernandina recently erected a new city wharf having a frontage of 1,000 feet and it is reported that the Seaboard Air Line Railway will extend its trackage in Fernandina to the northward.

10. *Public hearing.*—A public hearing was held on July 2, 1940, at Fernandina, Fla., with a view to determining if further improvement of Fernandina Harbor, in the interest of navigation, is advisable at this time. A copy of the minutes[1] of the hearing is enclosed. The hearing was attended by the city officials, navigation interests, and by representatives of the two pulp and paper mills at Fernandina. Since the hearing, Rayonier, Inc., and Container Corporation of America have submitted additional data.

11. *Improvement desired.*—Local interests desire that the present project for the improvement of Fernandina Harbor be modified so as to provide a minimum depth of 30 feet at mean low water in the present authorized channels and in the turning basin. At the hearing the present maximum dredged width of the turning basin, 800 feet, was discussed with the shippers and pilots. These interests agreed that the location of the basin and a maximum width therein of 800 feet were satisfactory for the needs of navigation. It was brought out during the discussion that there would probably be better currents

[1] Not printed.

through the 800-foot-wide basin for the maintenance of dredged depths in the basin, in the adjacent channel, and at the principal wharves than there would be if the width of the basin was increased to 1,000 feet.

12. *Commerce.*—(*a*) The following is a comparative statement of traffic for Fernandina Harbor covering the last 10 years:

Year	Vessel traffic	Rafted	Total	Passengers	Year	Vessel traffic	Rafted	Total	Passengers
	Tons	*Tons*	*Tons*			*Tons*	*Tons*	*Tons*	
1930	311,415	1,800	313,215	----------	1935	163,061	----------	163,061	3,003
1931	238,089	1,300	239,389	----------	1936	177,212	----------	177,212	3,120
1932	144,662	900	145,562	----------	1937	140,336	----------	140,336	----------
1933	79,712	----------	79,712	----------	1938	206,478	----------	206,478	742
1934	172,829	----------	172,829	----------	1939	177,600	----------	177,600	360

It will be noted from the tabulation that the tonnage decreased to a minimum of 79,712 tons in 1933, and that since that year there has been a fairly steady recovery. Details of the principal articles of commerce moving over Fernandina Harbor during the calendar year 1939 are given in the following tabulation:

Class of commodity	Foreign		Domestic				Local	Total
			Coastwise		Internal			
	Imports	Exports	Receipts	Shipments	Receipts	Shipments		
Chemicals	4,598	97,015	----------	----------	----------	----------	----------	101,613
Nonmetallic minerals	----------	----------	1,045	----------	17,992	----------	----------	19,037
Wood and paper, wood pulp	----------	----------	----------	24,460	1,036	----------	----------	25,496
Animals and animal products	----------	----------	----------	----------	3,864	----------	25,174	29,038

Foreign commerce is confined to imports of salt and crude sodium sulphate and exports of phosphate rock. Domestic commerce included shipments of 24,460 tons of wood pulp and receipts of 17,992 tons of petroleum products. Local traffic included 24,491 tons of menhaden fish.

(*b*) The prospective commerce will probably consist principally of the same commodities as are now being handled. From information obtained at the hearing and from data furnished since the hearing, Rayonier, Inc., is now shipping by deep draft vessels high quality sulfite pulp at the rate of 80,000 tons per annum, and is receiving sulfur and other chemicals at the rate of 20,000 tons per annum. This company also receives about 30,000 tons of fuel oil per annum, but this moves by barge over the inland waterway from Jacksonville.

(*c*) The manager of the Container Corporation of America plant stated that the 1939 commerce was a good indication of what he would ship in future years, and the manager of the phosphate plant said that on his books were orders for 350,000 tons of phosphate rock which he expected to ship eventually to Europe. Under present European conditions, the rate of shipment of this rock and the matter of future orders are, of course, problematical.

(*d*) At the hearing it was stated that it was expected there would be new commerce other than that described above and that full information on this would be furnished later. It was not stated definitely what the nature of this additional commerce was expected to be, but the information given indicated it to be in connection with national defense. A few days after the hearing, information was received that the prospect of this additional shipping could no longer be counted on.

13. *Survey.*—(*a*) No survey was made especially for this report. The hopper dredge *Culebra* worked on the channel between the jetties in April and May 1940, and a survey of the area worked over made immediately thereafter shows that after the dredging there was one sounding of 28.5 feet and a least depth on the remainder of the shoal of 29.3 feet. A survey made May 15–24, 1940, after completion of the contract dredging for improvement of the inner harbor to 28 feet, shows that except for a few small areas, there were no depths in the channels or in the turning basin less than 30 feet at mean low water. The yardage that remained above 30 feet was only about 5,000, and that to remove this and 2 feet additional, the dredging required would be about 20,000 cubic yards. Probings made prior to the contract dredging show materials above a depth of 30 feet to be sand.

(*b*) Profiles and cross-sections of the stone jetties on each side of the entrance channel were made in 1939. These profiles show the north jetty to have general heights ranging from 4.6 feet to 5.3 feet above mean low water, and the south jetty general heights ranging from 4.3 feet to 5.9 feet above mean low water. From the soundings on the north side of the south jetty, it will be noted that a deep natural channel has developed close to the outer 2,000 feet of the structure. The condition of the jetty in this length and the depths and location of the natural channel are examined periodically, with a view to stopping any undermining of the structure that might occur, but so far no deterioration that may be directly charged to undermining has been discovered.

(*c*) Basic data for the enclosed general map is United States Coast and Geodetic Survey chart No. 453, issue of 1939. Soundings on this chart are shown on the map, except that they have been revised, where necessary, to agree with the latest surveys by this office. Other data, such as the established harbor line, spoil-disposal areas owned by the United States, and other general information, have been added.

14. *Plan of improvement.*—To provide the additional depth desired, the plan of improvement consists of deepening to 30 feet at mean low water the present authorized channels from the sea to about the southerly end of the Florida Terminal Corporation's wharf. Southerly from this wharf it is necessary to move about 1,600 feet of the easterly channel line farther from the shore in order to place it at a safe distance from the Rayonier Inc., wharf after it has been extended under War Department permit. The remainder of the channel line below is to remain in its present position. About opposite the wharf of Rayonier Inc., an area is shown on the map which was dredged by that company to compensate for extension of the wharf under the War Department permit mentioned above. Dredging in this area to 30 feet is included in the plan. The line along the northerly side of the turning basin is on the edge of the recent dredging done under the present project. These new lines and those which they supersede are shown on the insert map of the general map enclosed.

15. *Estimates of cost.*—(*a*) In computing the yardages to be removed, the following assumptions were made:

(1) That between the present time and the time when the improvement may be made, the channels will have shoaled to depths less than those shown by latest surveys, but that the least depths in these channels will be 28 feet at mean low water.

(2) That the lengths of channel then to be dredged over will be those between 30-foot contours of depth, with those contours in the same location as they were before the last improvement dredging.

(3) That the overdepth dredging between depths of 30 and 32 feet, except for side slopes, cover the same areas as the dredging from 28 to 30 feet.

(4) The unit prices used are based on the assumption that for the dredging between the jetties, the hopper dredge *Culebra* will be used, at a unit cost of 16 cents per cubic yard. For the remainder of the dredging, it is assumed that the work will be done by contract, at a unit cost of 16 cents per cubic yard.

(*b*) Federal investment:	
Dredging to 30 feet: 286,828 cubic yards at 16 cents	$45,892.48
Allowable overdepth dredging of 30 to 32 feet: 329,473 cubic yards at 16 cents	52,715.68
Engineering and contingencies	9,391.84
Total Federal investment	108,000.00
(*c*) Federal annual carrying charges:	
Interest on $108,000 at 3½ percent	3,780.00
Amortization in 50 years	821.00
Additional maintenance cost of project	2,000.00
Total Federal carrying charges	6,601.00
(*d*) Non-Federal investment	0.00
(*e*) Non-Federal carrying charges	0.00

16. *Maintenance.*—(*a*) The present project depth of 28 feet has not existed long enough to give accurate data on the maintenance work which will probably be required in channels of this depth or in corresponding channels of greater depth. In the document under review, the maintenance costs of the 28-foot depths of the present project were estimated to be $6,000 for the inner harbor; upkeep of the entrance jetties, after repairs contemplated at that time, $20,000 per annum; and dredging between the jetties, $5,000; a total of $31,000 per annum. The repairs to the jetties have not yet been made.

(*b*) In April and May 1937, the channel between the jetties was dredged to a depth of about 30 feet, and in April and May 1940, restoration of this depth required the removal of about 248,000 cubic yards, at a cost of $12,805. At this rate, with the jetties in their present condition, maintenance of a 30-foot depth in the jetty channel requires about $4,300 per annum. This is close to the estimated cost of $5,000 mentioned above. For the jetties themselves and the channel between, the estimated annual cost of maintenance under the proposed improvement is taken as $20,000 and $5,000 respectively.

(*c*) In House Document No. 548, the costs of maintaining depths of 26 feet in the inner harbor between 1923 and 1927 were given as about $2,000 per annum. The estimated annual cost of maintaining these channels at 28 feet was placed at $6,000. In view of the small

increase in depth involved in the proposed channels over the present ones, it is probable that for maintaining depths of 30 feet in the inner harbor, the annual costs will not exceed $8,000. The annual maintenance costs for the proposed improvement, including the jetties, the channel between the jetties, and the inner harbor is, therefore, taken as $33,000, or $2,000 more than the estimated maintenance cost of the present project.

17. *Vessel traffic.*—(*a*) The following is a tabulation of trips and drafts of vessels in and out of Fernandina Harbor for the year 1939:

Draft	In-bound		Out-bound		Total
	Steamers	Other vessels	Steamers	Other vessels	
24 to 26 feet			1		1
22 to 24 feet	2		1		3
20 to 22 feet	1		11		12
18 to 20 feet	1		15	1	17
16 to 18 feet	8		11		19
14 to 16 feet	19	1	5		25
12 to 14 feet	11	1	1	1	14
Under 12 feet	4	5,559	1	5,559	11,123
Total	46	5,561	46	5,561	11,214

(*b*) It will be noted that there was one out-bound vessel having a draft of from 24 to 26 feet and two vessels having drafts of from 22 to 24 feet. From House Document No. 548, it is noted that from 1924 to and including 1936, the deepest draft of vessels using the harbor was 26 feet 7 inches. From the 1937 and 1938, inclusive, records, the deepest draft of vessels using the harbor was one vessel 24 to 26 feet in 1937, and one vessel 26 to 28 feet in 1938. From the records, therefore, it may be stated that since 1924, the deepest draft vessel using the harbor was 28 feet.

(*c*) Rayonier, Inc. desires to ship its products in vessels some of which draw more than 28 feet. It is claimed that with such vessels, pulp shipments may be used to complete the cargo of a vessel and, therefore, may be made in large vessels using Fernandina as the last port of call.

(*d*) The Container Corporation of America states that in view of the fact that they ship pulp from their wharf and that it is combined with shipments from Rayonier Inc. wharf, they need project depths in the channel of more than 28 feet.

(*e*) Mr. Hood, manager of the phosphate plant, indicated that his product was the first cargo loaded in vessels and that it was then taken out of the harbor on drafts of about 25 feet. It appears, therefore, that for the handling of phosphate, vessels may be used which can be accommodated by the present project depth.

18. *Difficulties attending navigation.*—(*a*) Vessels drawing 27 feet or less have no difficulty in moving through channels with the present project depth. For these vessels, the depths, locations, and widths of the channel are satisfactory, and the turning facilities that have been provided are ample. For vessels with drafts in excess of 27 feet, local interests claim that the present project depth of 28 feet at mean low water is not sufficient.

(*b*) To have a clearance of 1 foot under the keel, a vessel drawing 28 feet and reaching the outer end of the jetty channel at low water must wait about 1½ hours. Low water occurs at the southern end of the harbor about 48 minutes after it does on the bar. With the bar channel and channels in the inner harbor having controlling depths of no more than 28 feet, the movement of a 28-foot draft through the harbor would not be safe until about 2¼ hours after low water on the bar.

(*c*) Of all of the actual low waters which occur, about half are lower than the mean, and some of these low stages are as much as 1.5 feet below the mean. Such tides would cause a delay of more than 2¼ hours after low water on the bar for ships desiring to enter the harbor at low water and having drafts of more than 27 feet.

19. *Water power and other special subjects.*—(*a*) There are no questions of water power, land reclamation, protection from floods, or other special features so related to the plan of improvement that they can be coordinated therewith to lessen the cost and compensate the Government for expenditures made in the interest of navigation.

(*b*) There are no areas in Amelia River or in the channel between the jetties that appear to be suitable for seaplane bases. In Cumberland Sound, however, there are water areas that may be suitable for such purposes.

(*c*) The waters of the harbor are polluted to some extent by raw sewage from the city and waste from industrial plants, but this does not affect navigation injuriously.

(*d*) The harbor is not used to any considerable extent for public bathing, these facilities being furnished by an extensive beach on the easterly side of Amelia Island. It does afford, however, considerable recreational facilities to small-boat owners.

(*e*) The improvement for navigation already made and those proposed do not affect wildlife conservation.

20. *Discussion.*—(*a*) From statements at the hearing and information obtained subsequent thereto, it appears that the request for the examination of Fernandina Harbor with a view to increasing its project depth was made on the prospect that a large development manufacturing products necessary for national defense was expected to locate at Fernandina. Prior to the hearing, promoters of this development had obtained options on large tracts of land close to the harbor, and it was expected that extensive manufacturing facilities would be erected on this land. A few days before the hearing, officials of this new company visited Fernandina, refused to take up their options, and stated that there was no certainty that the property would be acquired and the plants erected. The need for further improvement of the harbor, if any, therefore, rests on the needs of the present shippers.

(*b*) From the statements of the manager of the Florida Terminal Co., he has no frequent difficulty in his shipments of phosphate rock due to deficient channel depths and, as there is no information to indicate that conditions under which this commodity must be shipped will change, it is probable that present project depths are sufficient for vessels serving this industry at Fernandina.

(*c*) The traffic manager of the Container Corporation of America writes that up to the present time, no trouble has been experienced by vessels not being able to reach his wharf, but in view of the fact

that his company ships pulp in the same cargo with Rayonier, Inc., his needs for channel depths are the same as those of Rayonier, Inc.

(*d*) All other commodities except those received and shipped by the paper mills are handled in vessels drawing less than 28 feet, so that the only local interests showing the need for increased channel depth are the two paper mills, of which Rayonier, Inc., is the larger.

(*e*) With its letter of July 24, 1940, Rayonier, Inc., submits a list of vessels operated by steamship lines with which it has been negotiating to handle wood pulp. In this list there are 29 vessels, 11 of which have drafts of more than 27 feet. It is stated in the letter that none of the ships on the list have come to Fernandina, and as the larger percentage draws 27 feet and less, the failure to obtain these ships to handle the paper-mill cargoes must have been due to reasons other than the lack of channel depths.

(*f*) Since the hearing, information has been obtained from shipping interests which indicates that present shipping conditions do not make it difficult to obtain vessels of moderate draft, and that refusal of a vessel to come to a port to load cargo is often due to the fact that the cargo offered is not large enough to justify the vessel making the shipping point a port of call, and that if the cargo must be shipped without delay, it must be forwarded to a port where a vessel that has available cargo space is loading.

(*g*) Rayonier, Inc., manufactures a very fine grade of sulphite paper pulp which is put up in bundles and wrapped with paper. It is stated that the price received for this pulp depends somewhat on its condition when it is received by the purchaser, and it is claimed that the shorter time in transit in a ship's hold and the method of loading it is a factor in its condition when delivered to the purchaser. Rayonier, Inc., therefore, desires to load its product in vessels making Fernandina the last port of call so that the pulp will be a shorter time in transit and so that by loading it on top of other cargo, the bundles will not be damaged. It is the opinion of steamship agents who have been consulted that the extra time in transit complained of is not large and should not be sufficient to damage the quality of the pulp, and that when cargo is loaded in a vessel, care is always taken to place it so that it will not receive damage from other cargo. From the information obtained, it is believed that the extra time in transit resulting from ships making Fernandina an early port of call and the position in the hold of the ship of the paper pulp with respect to other cargo does not cause any appreciable amount of damage to the pulp.

(*h*) The recent improvement of the channel and turning basin resulted in obtaining depths therein of 30 feet at mean low water. To maintain the channel in this condition, it is estimated that the cost will be $2,000 per annum above the estimated cost of maintaining the present project. Authorization for the maintenance of a depth of 30 feet, however, cannot be obtained before this depth is authorized as a project depth, and before such depth can be authorized, the channels will probably shoal so that the estimated cost of restoring the depth of 30 feet and maintaining this depth would be about $6,601.

(*i*) Maintenance dredging by Government plant should not be done close enough to a privately owned terminal structure to endanger its foundations. After the wharf of Rayonier, Inc., is extended under War Department permit, the southerly side of the present channel will lie

against the face of the extension and should be moved northwesterly about 50 feet, as shown on the enclosed map.

(*j*) The maximum width of the authorized turning basin is 1,000 feet. A maximum width of 800 feet is believed by the local pilots to be sufficient for turning the largest ships that will use the harbor. This opinion is concurred in, and it will be advantageous to the United States, from the standpoint of maintenance cost, to reduce the present authorized maximum width to 800 feet. The area dredged by Rayonier, Inc., opposite their terminal, to recompensate in cross-sectional area for their wharf extension, should be included in the authorized channel. The boundary lines of the channel and turning area to accomplish these changes are shown on the enclosed map.

21. *Conclusions.*—The difficulties claimed in obtaining vessels for the commerce of Fernandina, if real, are not due to deficient channel depths but to the size of the cargoes offered for shipment and which are sometimes too small to make it profitable for a vessel to select Fernandina for a port of call. The expense shippers have incurred heretofore from having to ship their products to another port where a vessel is loading will not be saved by providing additional channel depths in the harbor. The benefits claimed from a shortening of the time of water transit and from loading pulp in a different manner than at present are not large enough to be a material factor in the argument for the improvement desired. The total benefits to be derived from the improvement are, therefore, less than the costs of improvement, although these are estimated to be small. To lessen the cost of maintenance of the project and to eliminate possible damage to privately owned terminal structures from operation of Government plant in the authorized channel, the southerly channel line opposite the Rayonier, Inc., terminal should be moved northwesterly 50 feet, the maximum width of the turning area reduced to 800 feet, and the area covered by compensatory dredging by Rayonier, Inc., should be included in the project. No additional costs are involved.

22. *Recommendation.*—It is recommended that no modification be made in the present project for Fernandina Harbor at the present time except to reduce the maximum width of the turning basin in the southerly end of the harbor from 1,000 feet to 800 feet, shifting the southerly channel line in this vicinity 50 feet northwesterly, and including in the authorized channel the area opposite its terminal, dredged by Rayonier, Inc., all at no additional cost.

G. B. TROLAND,
Major, Corps of Engineers,
District Engineer.

[First endorsement]

OFFICE OF THE DIVISION ENGINEER,
SOUTH ATLANTIC DIVISION,
Richmond, Va., September 25, 1940.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. It will be noted that the width of the turning basin scales about 800 feet on the accompanying map and on the map printed in the project document, although the width recommended in that document

was 1,000 feet. The basin was actually dredged to a width of 800 feet, which was evidently the width originally intended.

2. The views and recommendation of the district engineer are concurred in.

JARVIS J. BAIN,
Colonel, Corps of Engineers,
Division Engineer.

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WAR DEPARTMENT

CORPS OF ENGINEERS, U. S. ARMY

FERNANDINA HARBOR AND AMELIA RIVER, FLA.

IN 1 SHEET — SHEET NO. 1 — SCALE 1:40,000

0 1,000 2,000 3,000 4,000 5,000 FEET

U.S. ENGINEER OFFICE, SAVANNAH, GA. SEPT. - 1940

SUBMITTED: R. P. Hooker, PRINCIPAL ENGINEER

APPROVED: G. B. Ireland, MAJOR, CORPS OF ENGINEERS, U.S.A.

Drawn by: E.C.K. File No.

To accompany report dated Sept. 20, 1940. F. H. 503/5

Soundings refer to M. L. W.

Origin of Coordinates is ▲ Lanceford.

DFH 106/14

VICINITY MAP

BRUNSWICK, GEORGIA, ST. MARYS RIVER, LOCATION OF PROJECT, FERNANDINA, FLORIDA, JACKSONVILLE, ATLANTIC OCEAN, G.I.C.W.R.R.

0 5 10 15 20 25 MILES

LEGEND

- HARBOR LINE
- DUMPING AREAS
- AREAS REQUIRED TO BE DREDGED FOR IMPROVEMENT DESIRED
- WHARF EXTENSION AUTHORIZED UNDER WAR DEPARTMENT PERMIT DATED MAY 9, 1940.
- BOUNDARY OF FT. CLINCH STATE PARK

INSERT MAP

SCALE 1: 10,000

0 100 500 1000 FEET

LEGEND

- PRESENT CHANNEL LINES
- PROPOSED CHANNEL LINE CHANGES
- AUTHORIZED WHARF EXTENSION

GEORGIA, FLORIDA, ATLANTIC OCEAN, CUMBERLAND ISLAND, AMELIA ISLAND, ST. MARYS RIVER, CUMBERLAND SOUND, INTRACOASTAL WATERWAY, JOLLY RIVER, BELL RIVER, LANCEFORD CREEK, AMELIA RIVER, CLARK CR., FT. CLINCH, FORT CLINCH STATE PARK, DREDGED DRAINAGE CANAL, OLD FERNANDINA, CONTAINER CORPORATION OF AMERICA, CALHOUN ST., AMELIA ISLAND LIGHTHOUSE, CITY WHARF, FERNANDINA, FLA. STATE HWY NO. 13, NORTH JETTY, SOUTH JETTY, WHISTLE BELL, NO. 1, NO. 2, NO. 3, NO. 4, NO. 5, TRACT NO. 1 A 17± ACRES, TRACT NO. 1 B 42.5± ACRES, TRACT NO. 2 78.5± ACRES, TRACT NO. 3 81.5± ACRES, TRACT NO. 4 17± ACRES, TRACT NO. 5 37± ACRES, DREDGED BY RAYONIER INC., FLA. TERMINAL CORPORATION, RAYONIER INC., HARBOR LINE, 300', 400', 20,000 N, 20,000 E, 40,000 E, 2000 N., 2000 E., 4000 E., 6000 E., 30°42', 30°40', 81°30', 81°28', 81°26', 81°24', 81°22', ZERO

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